

MULTIMEDIA



UNIVERSITY

STUDENT IDENTIFICATION NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

T2, 2017/ 2018

BOM7094 – OPERATIONS MANAGEMENT

(MBA Full Time)

30 JANUARY 2018

9.00 a.m – 12.00 p.m

(3 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of **NINE (9)** pages (including the cover page).
2. Answer **ALL** questions. The marks distributions are given in parentheses.
3. Write all your answers in the **Answer Booklet** provided.

Question 1

- (i) Lee Soh makes wooden boxes in which to ship motorcycles. Lee and his three employees invest a total of 40 hours per day making the 120 boxes.
- (a) What is their productivity?
 - (b) Lee and his employees have discussed redesigning the process to improve efficiency. Assuming that they can increase the rate to 125 per day, what will be their new productivity?
 - (c) What will be their unit increase in productivity per hour?
 - (d) What will be their percentage change in productivity?

[8 Marks]

(ii) **Case Study: ICICI Bank**

ICICI Bank is India's second-largest bank in terms of assets (\$93 billion). The bank currently has subsidiaries in Europe, North America, and Asia, notably in Malaysia, Singapore, and Indonesia. Debashis Sarkar, the leader of the Organizational Excellence Group, is in charge of developing Lean techniques for ICICI. Lean has been widely applied to manufacturing with great success, and since the financial crisis in 2008, service companies have increased their efforts to improve flexibility while reducing operating costs. In the early 2000s, Sarkar went against the general trend that favoured Six Sigma methods applied to services. Coming from an industrial background, he decided to apply Lean, notably with the 5S techniques. He wanted tools that would be easily understood by the vast majority of employees, so everyone in the company could become, in effect, a continuous improvement facilitator.

When Lean is applied to the services sector, it is commonly called Lean Office, and its characteristics are similar to the characteristics of Lean in manufacturing: identifying value in processes and removing waste. Waste in services can be identified as overproduction of documents, batch processing of those documents versus a flow treatment of requests, long downtime of IT support services, and the need for corrections or operators' excessive motion to retrieve information.

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Like other good project managers, Sarkar started to implement the changes on a small scale so he could understand the specificities of Lean applied to services. Once he had tackled the initial challenges, he engaged the methods on a wider scope. The first target he set was to retrieve documentation is less than 30 seconds, and this laid the groundwork for a myriad of improvements. Customer response time decreased dramatically, processes became clearer and more efficient, workplaces became more manageable thanks to the removal of excessive documentation, and operating expenses plummeted. Once these improvements caught the CEO's attention, it was decided to roll out the technique globally.

However, the transformation didn't happen overnight, and many challenges had to be addressed, mainly due to the nature of services themselves. Processes are not visible, and they are complex, people-intensive, and technology dependent. All these elements combined make the visibility of the improvement projects especially difficult. Therefore, employees need to become champions of change, and they need adequate training.

Successful improvement efforts are generally achieved when adequate training is provided. However, most trainers recognize that traditional classroom teaching methods are not sufficient for training employees on Lean techniques and establishing the culture of continuous improvement in a company. As a result, Lean Office simulation games have emerged. These games have been successful for several reasons: Employees from service organizations are more likely to use computers than are employees from a shop floor, Lean is starting to being accepted as an improvement method applied to services, and Web-based simulations provide additional feature compared to PC-only training games.

During a normal Lean Office training session, trainers used to come to the workplace and animate workshops on pull and push flows. Now, thanks to the ubiquitous nature of the Internet, Lean training is taking the form of an online simulation game, enabling employees to play with the different tools; this "learning by playing" has been very successful both among managers and employees.

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A good Lean Office training simulation game should be intuitive, self-explanatory, and fun to play with to stimulate employees' engagement. Many Lean improvements have failed in companies because senior management, in their strategic approach to continuous improvement, have not recognized the need to incorporate employees and workers into the scheme. Staff are the champions of Lean and will drive the improvements over time. The success of Sarkar and ICICI in their bid to implement Lean Office relies mainly on the fact that they started on a small scale to test the different requirements and ensured that they would engage with employees' desire to change.

- (a) Why do you think employees sometimes feel threatened by productivity improvements?
- (b) If you were to implement Lean Office at ICICI Bank, what messages would you like to communicate to employees?
- (c) What methods would you use to communicate with ICICI employees? Do you think using different media would be a good idea?

[12 Marks]

Question 2

- (i) Tan Carpet and Trim installs carpet in commercial offices. Tan Hoon has been very concerned with the amount of time it took to complete several recent jobs. Some of his workers are very unreliable. A list of activities and their optimistic completion time, the most likely completion time, and the pessimistic completion time (all in days) for a new contract are given in the following table:

ACTIVITY	IMMEDIATE PREDECESSOR(S)	TIME ESTIMATES (IN WEEKS)		
		OPTMISTIC	MOST LIKELY	PESSIMISTIC
A	-	3	6	8
B	-	2	4	4
C	-	1	2	3
D	C	6	7	8
E	B, D	2	4	6
F	A, E	6	10	14

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G	A, E	1	2	4
H	F	3	6	9
I	G	10	11	12
J	C	14	16	20
K	H, I	2	8	10

- Calculate the expected time and variance for each activity.
- Determine the total project completion time and the critical path for the project?
- Determine ES, EF, LS, LF, and slack for each activity.
- What is the probability of completion of the project on or before 40 days?

[10 Marks]

(ii) Case Study: Temsa Global

Temsa Global is an automotive company with factories in Adana, Adapazari, Egypt. It produces buses, minibuses, and light trucks in its factories in Turkey. The company started out its business as a licensor of Mitsubishi products in 1984, when it could manufacture only the licensed products. Since 2001, Temsa Global has gradually developed design capabilities to support the shift in its product strategy.

In 2009, Temsa R&D and Technology Inc., which was founded in 2003, had more than 200 employees. In 2009, Temsa Global introduced its first city bus model, Avenue. Temsa Global has designed Avenue primarily for the European markets, in collaboration with its customer Arriva, a UK-based transport services company that has operations in 12 European countries. The Temsa R&D center cooperates with universities and research institutes on advanced technologies and breakthrough applications. Avenue was designed by Temsa Global's sister company Temsa R&D and Technology Inc., and the new design has decreased the production costs considerably. The cost reduction is expected to allow Temsa Global to price its buses competitively with respect to its competitors' similar products. Currently, the bus industry is moving toward hybrid power technologies, and green design continues to gain importance. Temsa Global has managed to catch this wave early; Avenue is over 1,700 pounds lighter than similar buses, thanks to the composite

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materials used in the body, and its hybrid version offers a 25% savings on fuel consumption.

The next step is to market Avenue in other European countries, as well as in Turkey. Customers in different markets have specific requirements, and Avenue's modular design will play a pivotal role in offering customized products. Through product design, Temsa has become a global brand in less than a decade. The next challenge Temsa faces is to support its customer-driven strategy with a service network that covers markets with seemingly different characteristics. This may require acquiring new skills.

- (a) What are the possible advantages of investing in the R&D center for advanced technologies? Discuss the implications, considering the changing perceptions and demands of consumers.
- (b) What should be the focus of Temsa Global in supporting its market-driven product strategy and customized designs?

[10 Marks]

Question 3

- (i) As you can see in the following table, demand for heart transplant surgery at Kuala Lumpur General Hospital has increased steadily in the past few years:

YEAR	1	2	3	4	5	6
HEART TRANSPLANTS	45	50	52	56	58	?

The director of medical services predicted 6 years ago that demand in year 1 would be 41 surgeries.

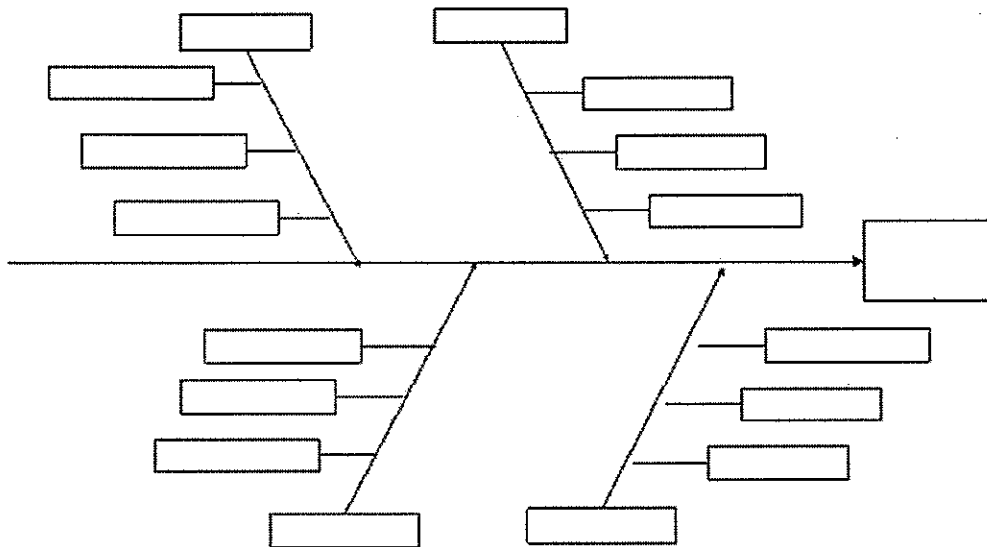
- (a) Use exponential smoothing, with a smoothing constant of 0.9, to develop forecasts for years 2 through 6.
- (b) Use the trend-projection method to forecast demand in years 1 through 6.
- (c) With MAD as the criterion, which of the two forecasting methods is best?

[12 Marks]

- (ii) Assuming that you have just come from a relative's wedding reception. It didn't turn out as well as it should have, and the bride's parents are pretty upset. Use the

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supplied template to construct a conventional cause-and-effect diagram. Identify 12 sources of defects for the issue "dissatisfied customer of wedding reception caterer." (Your 12 sources need not be exactly three per main cause, but should be a balanced treatment.) Categorize each cause onto a main cause. Provide brief support for each of your choices.



[8 Marks]

Question 4

- (i) JL Health and Beauty Products has developed a new shampoo, and you need to develop its aggregate schedule. The cost accounting department has supplied you the costs relevant to the aggregate plan, and the marketing department has provided a four-quarter forecast. All are shown as follows:

QUARTER	FORECAST
1	1,400
2	1,200
3	1,500
4	1,300

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COST	
Previous quarter's output	1,500 units
Beginning inventory	0 units
Stock cost for backorders	\$50 per unit
Inventory holding cost	\$10 per unit for every unit held at the end of the quarter
Hiring workers	\$40 per unit
Lay off workers	\$80 per unit
Unit cost	\$30 per unit
Overtime	\$15 extra per unit
Subcontracting	Not available

Your job is to develop an aggregate plan for the next four quarters.

- First, try hiring and layoffs (to meet the forecast) as necessary.
- Then try a plan that holds employment steady.
- Which is the more economical plan for JL Health and Beauty Products?

[12 Marks]

- "Manufacturers locate near their resources, retailers locate near their customers." Discuss this statement, with reference to the proximity-to-markets arguments. Can you think of a counter-example in each case? Support your choices.

[8 Marks]

Question 5

- Chong's Motors has the following demand to meet for custom manufactured fuel injector parts. The holding cost for that item is \$.75 per month and each setup costs \$150. Lead time is 0 months.

Month	1	2	3	4	5	6	7
Requirement	100	150	200	150	100	150	250

Calculate the planned order releases using:

- The EOQ technique

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- (b) The POQ technique.
- (c) What are the costs of each plan, including the holding cost of any inventory left over after month 7?

[10 Marks]

- (ii) During an argument as to the merits of preventive maintenance at Windsor Printers, the company owner asked, "Why fix it before it breaks?" How would you, as the Director of Maintenance, respond?

[10 Marks]

End of Paper